

Claims

What is claimed is:

1. A data cartridge handling system comprising:

a data cartridge storage array having a plurality of bins each for removably

5 receiving and storing a data cartridge;

a robotic manipulator operatively positioned for selectively retrieving data cartridges from the bins, transferring the retrieved data cartridges to and from a data reading and recording device and replacing data cartridges into the bins in

10 accordance with instructions received from a control system operatively coupled to the robotic manipulator for directing movement of the manipulator, the manipulator

including a grasping hand for grasping a selected data cartridge and moving the data cartridge in and out of a bin and a camera mounted on the hand for sensing the location of the hand with reference to each of the plurality of bins, wherein the

15 camera is operated during an audit operation initiated by the control system to provide bin location data to a memory subsequently utilized by the control system to position the grasping hand of the robotic manipulator.

2. A data cartridge handling system as defined in claim 1 wherein the camera is utilized only during the audit operation.

3. A system as defined in claim 2 wherein the camera includes an oscillator located on the hand whose output is selectively provided to the camera only during an audit operation.

4. A system as defined in claim 1 wherein the camera further provides cartridge identification data to the memory to provide a map of bin location and bin content.

5. A system as defined in claim 4 wherein manipulator positioning is only controlled by the camera during an audit operation.

6. A system as defined in claim 1 wherein the control system routinely directs movement of the robotic manipulator utilizing location data from the memory and operates the camera only during an audit operation.

7. A system as defined in claim 1 further comprising an oscillator whose output is selectively provided to the camera on the hand only during an audit operation.

8. A data cartridge handling library apparatus having reduced electromagnetic radiation emissions comprising:

a plurality of data cartridge storage bins arranged around a robotic manipulator for retrieving and replacing cartridges from and to the bins;

5 a camera mounted on the manipulator for sensing a position of the manipulator with respect to the plurality of data cartridge storage bins, the camera being operable during an audit operation to identify each bin location;

10 a manipulator control system operatively coupled to the robotic manipulator for selectively controlling movement of the manipulator and operating the camera to sense and record manipulator position information at each bin location and store position and bin location information in a memory accessible by the manipulator control.

9. The apparatus according to claim 8 system wherein the control system performs data cartridge storage and retrieval operations utilizing the bin location and manipulator position information stored in the memory to position the manipulator.

10. The apparatus according to claim 8 wherein the manipulator comprises a grasping hand having the camera mounted thereon.

11. The apparatus according to claim 10 wherein an oscillator mounted on the hand has an output enabled to operate the camera during an audit operation.

12. The apparatus according to claim 8 further comprising a grasping hand on the manipulator having the camera mounted thereon, the camera having an oscillator having an output enabled by the control system, wherein the control system disables the output of the oscillator and performs data cartridge storage and

5 retrieval operations utilizing the bin location and manipulator position information stored in the memory during normal library operations.

13. The apparatus according to claim 12 wherein the oscillator output is enabled only during an audit operation by the manipulator control system.

14. A method for reducing electromagnetic radiation emissions from a data cartridge handling library apparatus comprising the steps of:

providing a plurality of data cartridge storage bins arranged around a robotic manipulator for retrieving and replacing cartridges from and to the bins

5 providing a manipulator control system operatively coupled to the robotic manipulator for selectively controlling movement of the manipulator;

providing a camera mounted on the manipulator for sensing a position of the manipulator with respect to the plurality of data cartridge storage bins;

turning on the camera;

10 performing an audit operation using the camera to identify each bin location, record manipulator position information at each bin location and store bin location information in a memory accessible by the manipulator control system;

turning the camera off;

performing subsequent data cartridge storage and retrieval operations

15 utilizing the bin location and manipulator position information stored in the memory to position the manipulator.

15. A method as defined in claim 14 wherein the manipulator comprises a grasping hand having the camera mounted thereon and the step of turning on the camera includes the step of enabling an output of an oscillator mounted on the hand.

16. The method as defined in claim 15 wherein the step of turning off the camera includes disabling the output of the oscillator mounted on the hand.

17. A method for reducing electromagnetic radiation emissions from a data cartridge handling library apparatus comprising the steps of:

providing a plurality of data cartridge storage bins arranged around a robotic

manipulator for retrieving and replacing cartridges from and to the bins

- 5 providing a manipulator control system operatively coupled to the robotic manipulator for selectively controlling movement of the manipulator;

 providing a camera mounted on the manipulator for sensing a position of the manipulator with respect to the plurality of data cartridge storage bins;

 operating the camera during an audit operation to identify a bin location,

- 10 record manipulator position information at the bin location and store bin location information in a memory accessible by the manipulator control system.

18. The method according to claim 17 further comprising the step of:

 performing data cartridge storage and retrieval operations utilizing the bin location and manipulator position information stored in the memory to position the manipulator.